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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,085	12/04/2001	Anthony C. Mulligan	003248.00045	8564

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EXAMINER

SAVAGE, JASON L

ART UNIT	PAPER NUMBER
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1775

12

DATE MAILED: 06/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.		Applicant(s)	
10/005,085		MULLIGAN ET AL.	
Examiner		Art Unit	
Jason L. Savage		1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 25-32 is/are pending in the application.
- 4a) Of the above claim(s) 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-13 and 31 is/are rejected.
- 7) ☒ Claim(s) 7, 14 and 25-30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 6 8 10. 6) ☐ Other: _____

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Election/Restriction

1. Newly submitted claim 32 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Inventions of claims 1-14 and 25-31 and claim 32 are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the inventions differ in that claims 1-14 and 25-31 are directed to a structure having at least 3 phases with the inner and outer phases being ceramic and the intermediate layer being a metal phase whereas the invention of claim 32 is directed to a structure having only an inner and outer portion wherein each of the two portions imparts a different functionality to the structure.

2. Applicant made an election with traverse to prosecute the invention of Group I, claims 1-14 and newly added claims 25-31 for prosecution on the merits. Accordingly, claim 32 has been withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

3. Applicant's election of the claims of Group I in Paper No. 9 is acknowledged. Applicant argues that all of the claims are directed to composite structures that are capable of two or more discrete functions and thus the groups are not unrelated. While the inventions may be capable of the same general concept of being able to perform multiple discrete functions, the mode of

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operations and in some cases the functions themselves differ between each group. While Applicant asserts that each embodiment is directed to generally the same subject matter, he has not show how all of the embodiments have the same mode of operation, function and effects. Therefore, the restriction is proper and made **FINAL**.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: Reference numbers **34** and **36** shown in figure 3 are not described in the specification.. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-6, 9-10, 13 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Young (US 6,361,873).

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Young teaches multifunctional structures which may contain a hard inner phase, an intermediate ductile phase and a hard outer phase and that the hard phases may be the same material (col. 7, ln. 32-45). Regarding the limitation the structure be a fibrous monolith, Young teaches ordered microstructures which are intentionally arranged to provide improved properties (col. 2, ln. 16-22). It would have been obvious to one of ordinary skill in the art at the time of the invention to have formed a fibrous monolith following the teachings of Young since fibrous monoliths typically have an ordered structure.

Regarding the limitation that the hard inner phase be a ceramic and the hard outer phase be a ceramic, Young teaches hard materials are preferably ceramics such as PCD or PCBN (col. 3, ln. 52-67). Regarding the limitation that the soft intermediate phase is metal, Young teaches that the soft ductile phase may be any of a number of different materials including metals and metal alloys (col. 4, ln. 12-23).

Regarding claims 2-5, the intermediate metal phase of Young would have been just a capable of allowing for measurements of strain, temperature and damage propagation.

Furthermore, on page 19, lines 1-16 of the specification, Applicant states that in order to such tests to be performed, terminals are formed on the structure and voltage is applied. The structure of Young would have been just as capable of allowing for a modification of adding terminals to the structure in order to test the claimed properties.

Regarding claim 6, Young teaches that metal may be an alloy of various metals including an alloy of W (col. 4, ln. 12-16). Alloys of W and Re are known. It would have been obvious to

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one of ordinary skill in the art to have used any known alloy of W, including alloys of W and Re, since alloys of W are taught as being suitable materials. Furthermore, absent a teaching of the criticality of the claimed combination of materials for the intermediate layer, it would not provide a patentable distinction over any other alloy of W.

Regarding claims 9-10 and 13, Young teaches a structure which may be an insert for machine tools. Young do not teach a drill bit; however it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed a drill bit from the structural material since hard and wear resistant materials are desirable for a drill bit. Regarding the limitation that the component be capable of measuring the different properties, the structure of Young would be just as capable of making the claimed measurements.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Young (US 6,361,873) in view of Sue (US 6,063,502).

Young teaches what is set forth above but it is silent to the material combination in claim 8. Sue teaches fibrous monolith structures (col. 2, ln. 14-27). Sue further teaches that a combination of WC-Co as a hard phase material in combination with W-Ni-Fe as a soft ductile phase is a desirable combination (col. 7, ln. 47-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have formed the inner and outer hard phases in the structure of Young from WC-Co and the intermediate phase from W-Ni-Fe since such a combination is desirable.

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8. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Young (US 6,361,873) in view of Popovic (US 5,645,781).

Young teaches what is set forth above however it is silent to using the fibrous monolith structure as a rocket nozzle. Popovic teaches fibrous monoliths are useful for a multiplicity of applications such as high temperature applications such as engine components (col. 1, ln. 18-30). It would have been within the level of one of ordinary skill in the art at the time of the invention to have used the fibrous monolith of Young in a high temperature application such as nozzles for rockets since fibrous monoliths are known to be useful for such applications.

Allowable Subject Matter

9. Claims 7, 14 and 25-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. Any inquiry to this communication or earlier communications from the Examiner should be directed to Jason Savage, whose telephone number is (703)305-0549. The Examiner can normally be reached Monday to Friday from 6:30 AM to 4:00 PM.


If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Deborah Jones, can be reached on (703)308-3822.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703)308-2351.



Jason Savage

6-16-03